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Committee on the Peaceful Uses of Outer Space

Report of the Expert on Space Applications*

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* It was necessary to summarize in the report each of the activities organized under the United Nations Programme on Space Applications, the last of which was concluded on 30 November 2001.

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I. Introduction

1. At its thirty-eighth session, in 2001, the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space reviewed the activities of the United Nations Programme on Space Applications. The Subcommittee noted that the 2000 activities of the Programme had been carried out satisfactorily. On the recommendation of the Committee, the Programme for 2001 had been endorsed by the General Assembly in its resolution 55/122 of 8 December 2000.

2. The Subcommittee recommended to the Committee, for its approval, the activities scheduled for 2001 and noted the other activities of the Programme. All of the activities were to be implemented as part of those recommendations of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III) related to space applications, as proposed by the Expert on Space Applications in his report (A/AC.105/730) submitted to the Scientific and Technical Subcommittee at its thirty-seventh session, in 2000. Summaries of the activities carried out within the framework of the Programme in 2001 and those scheduled for implementation in 2002 are presented in annexes I and II. The activities proposed for 2003 are presented below.

II. Mandate of the United Nations Programme on Space Applications

3. The General Assembly, in its resolution 37/90 of 10 December 1982, expanded the mandate of the United Nations Programme on Space Applications to include, in particular, the following elements:

(a) Promotion of greater exchange of actual experiences with specific applications;

(b) Promotion of greater cooperation in space science and technology between developed and developing countries as well as among developing countries;

(c) Development of a fellowship programme for in-depth training of space technologists and applications specialists;

(d) Organization of seminars on advanced space applications and new system developments for managers and leaders of space application and technology development activities as well as seminars for users in specific applications;

(e) Stimulation of the growth of indigenous nuclei and an autonomous technological base, in cooperation with other United Nations organizations and/or States Members of the United Nations or members of the specialized agencies;

(f) Dissemination of information on new and advanced technology and applications;

(g) Provision or arrangements for provision of technical advisory services on space applications projects, upon request by Member States or any of the specialized agencies.

4. In its resolution 55/122, the General Assembly noted that the Office for Outer Space Affairs of the Secretariat had submitted to the Committee for its review at its forty-third session a plan of action to implement the recommendations of UNISPACE III.[1] That plan of action contained a number of activities to be carried out under the Programme. In the same resolution, the Assembly requested the Secretary-General to begin implementing those measures and activities contained in the plan of action and currently within the programme of work of the Office for Outer Space Affairs and to ensure the full implementation of the plan with necessary resources in 2002. The activities to be carried out in 2002 under the Programme are in accordance with that request by the Assembly.

III. Orientation of the Programme

5. The United Nations Programme on Space Applications will be aimed at further promoting, through international cooperation, the use of space technologies and data for sustainable economic and social development in developing countries by raising the awareness of decision makers of the cost-effectiveness and additional benefits to be obtained; establishing or strengthening the capacity in developing countries to use space technology; and strengthening outreach activities to disseminate awareness of the benefits obtained.

6. The overall strategy of the Programme is to concentrate on a few themes of major importance for

developing countries and to establish objectives that can be achieved in the short and medium term. For each theme, individual activities will build on the results of previous activities aimed at achieving concrete results in a period of 1-3 years. The priority themes of the Programme as noted by the Committee at its forty-fourth session[2] are: (a) disaster management; (b) satellite communications for tele-education and telemedicine applications; (c) monitoring and protection of the environment; (d) management of natural resources; and (e) education and research areas in basic space sciences. Within each priority theme, the Programme would aim to achieve the following two objectives: (a) capacity-building; and (b) building awareness among decision makers in order to strengthen local support for the operational use of space technologies.[3] Other areas that the Programme would promote include developing capability in enabling technologies, such as the use of global navigation and positioning satellite systems, spin-offs of space technology, promoting the participation of youth in space activities, applications of small satellites and microsatellites and promoting the participation of private industry in activities of the Programme.[4]

7. The Committee, at its forty-fourth session, identified the recommendations of UNISPACE III that had been given highest priority. It also noted that for some of the recommendations, offers had been made by interested member States to exercise leadership in conducting the work associated with the recommendations. The Committee agreed to establish action teams to implement those recommendations under voluntary leadership of interested member States.[5] The activities of the Programme will support, to the extent possible, the action teams established by the Committee.

8. The activities of the Programme will concentrate on:

(a) Providing support for education and training for capacity-building in developing countries through the regional centres for space science and technology education and the Network of Space Science and Technology Education and Research Institutions for Central Eastern and South-Eastern Europe;

(b) Organizing workshops on advanced space applications and short- and medium-term training programmes;

(c) Strengthening its long-term fellowship programme to include support for the implementation of pilot projects;

(d) Promoting the participation of youth in space activities;

(e) Supporting or initiating pilot projects as follow-up to activities of the Programme in areas of priority interest to Member States;

(f) Providing technical advice, on request, to Member States, bodies and specialized agencies of the United Nations system and relevant national and international organizations;

(g) Enhancing access to space-related data and other information.

IV. Activities of the Programme

A. Support for disaster management

9. Within the framework of the United Nations Programme on Space Applications, regional workshops are being organized on the use of space technology in disaster management, in particular for the benefit of developing countries. The objectives of the workshops, which will support the work of the action team of the Committee on disaster management, are:

(a) To increase the awareness of managers and decision makers involved in disaster management of the potential benefits and the cost-effectiveness of using space technologies;

(b) To determine the types of information and communications needed in managing specific disasters and the extent to which they could be met by space technologies;

(c) To develop a plan of action that could lead in the near future to pilot projects that incorporate and demonstrate to decision makers the use of space tools in disaster management.

10. The first of the workshops was held for the benefit of countries in Latin America and the Caribbean in November 2000. The second and third

workshops are to be held for the benefit of countries in Africa and in Asia and the Pacific respectively. The workshop schedule is contained in annex II.

B. Promoting the use of enabling technologies

11. Global navigation satellite systems (GNSS) are a new global instrument offering increasing benefits in people's daily lives. The benefits of GNSS applications are growing in such areas as aviation, maritime and land transportation, mapping and surveying, agriculture, power and telecommunications networks, and disaster warning and emergency response, to name a few. Particularly for developing countries, GNSS applications offer cost-effective solutions to problems encountered in pursuing economic and social growth.

12. For 2002, four regional workshops have been organized within the framework of the United Nations Programme on Space Applications that will focus on issues of common concern and interest to each region. The conclusions and recommendations of all the regional workshops will be reviewed at an international meeting by a group of experts for possible further action (see annex II).

C. Development of indigenous capability

13. The efforts of the United Nations Programme on Space Applications in developing indigenous capability have focused, in large part, on the establishment of regional centres for space science and technology education in developing countries and a Network of Space Science and Technology Education and Research Institutions for Central Eastern and South-Eastern Europe. The Programme continues to emphasize cooperation with Member States at the regional level aimed at establishing and supporting the centres and the network.

14. At its thirty-eighth session, in 2001, the Scientific and Technical Subcommittee had before it a document (A/AC.105/749) containing information received by the Office for Outer Space Affairs on the activities conducted by the regional centres and the Network since their establishment, as well as their activities planned for 2001 and beyond. The highlights of the activities of the regional centres that were supported under the Programme in 2001 are summarized below.

1. Africa

15. In 2001, a nine-month course on satellite communications was completed at the African Regional Centre for Space Science and Technology—in French Language. The Programme was also represented in the meeting of the Governing Board of the Centre held in Rabat on 30 October 2001. The second nine-month course on remote sensing and geographic information systems (GIS) started in November 2001 while the second course on satellite meteorology started in January 2002.

16. The second course on remote sensing and GIS started in November 2001 at Ile-Ife, Nigeria, at the African Regional Centre for Space Science and Technology Education—in English Language.

2. Asia and the Pacific

17. Since its establishment in 1995, the Centre for Space Science and Technology Education in Asia and the Pacific has held 11 nine-month postgraduate courses: five courses on remote sensing and GIS, two courses on satellite communications, two courses on satellite meteorology and two courses on space science. The sixth nine-month postgraduate course on remote sensing and GIS began on 1 October 2001. In 2002, the Centre plans to hold the following courses: (a) the third nine-month postgraduate course on satellite meteorology, at the Space Applications Centre in Ahmedabad, India; (b) an international course on remote sensing and GIS technology applications in natural resources and environmental management, at the Indian Institute of Remote Sensing in Dehra Dun, India; (c) the third nine-month postgraduate course on space science, at the Physical Research Laboratory in Ahmedabad; (d) the seventh nine-month postgraduate course on remote sensing and GIS, at the Indian Institute of Remote Sensing in Dehra Dun; (e) a short-term course and workshop on satellite meteorology, at the Space Applications Centre in Ahmedabad.

3. Western Asia

18. The United Nations Programme on Space Applications has continued to provide technical support to the Government of Jordan in its preparations for the establishment in Jordan of the regional centre

for space science and technology education for western Asia. A planning meeting for the inauguration of the centre is to take place in the second half of 2002, after a draft agreement to establish the centre has been formulated and circulated to States in western Asia.

D. Long-term fellowship programmes for in-depth training

19. Under the long-term fellowship programmes for in-depth training of the United Nations Programme on Space Applications, two six-month fellowships for research in remote-sensing technology tenable at the European Space Research Institute facilities of the European Space Agency (ESA) in Frascati, Italy, for the period 2001-2002, are allowing university educators from Tribhuvan University in Nepal and the Open University of Sri Lanka to improve their skills. Both educators had participated in the United Nations/Sweden series of courses.

20. For the period 2001-2002, ESA is also offering, through the Programme, three fellowships, each for a period of one year, at the European Space Research and Technology Centre at Noordwijk, Netherlands. The fellowships, for research and study in Communications Systems, in Space Antennas and Electromagnetics and in Remote Sensing Instrumentation, will benefit participants from the China Telecommunications Broadcast Satellite Corporation, the Ho Chi Minh City Institute of Physics of Viet Nam and the Defence Engineering College of Ethiopia.

E. Technical advisory services and promotion of regional cooperation

21. Various technical advisory services currently being provided, as well as activities that promote regional cooperation that are co-sponsored under the auspices of the United Nations Programme on Space Applications, are described below.

1. Follow-up activities of the United Nations/European Space Agency workshops on basic space science

22. Since 1991, when the series of United Nations/European Space Agency workshops on basic space science began, the workshops have provided researchers and educators from developing countries with knowledge about and new ways and means of conducting basic space science.

23. Recent accomplishments of the activities to follow up the series of workshops on basic space sciences include the distribution of regional astronomical newsletters, through the World Wide Web and in hard copy, on a regular basis, as recommended by the workshop held in 1996. For Africa, through collaboration between the South African Astronomical Observatory and the Observatoire Midi-Pyrénées of France, the regional newsletter "African Skies/Cieux Africains" is being published and is available at http://www.saao.ac.za/~wgssa. For Asia and the Pacific, the National Astronomical Observatory of Japan publishes the regional newsletter "Teaching of Astronomy in Asia-Pacific Region". For Latin America and the Caribbean, the regional newsletter "Astronomia Latino Americana" is being published by the Universidad de Guanajuato of Mexico and is available at http://www.astro.ugto.mx/~aia/.

2. Asia-Pacific Satellite Communications Council

24. Since its establishment in 1994, with the assistance of the United Nations Programme on Space Applications, the Asia-Pacific Satellite Communications Council (APSCC) has grown considerably; it currently has 90 members from 31 countries. APSCC has played a key role in promoting the development of and cooperation in satellite communications in Asia and the Pacific by providing a platform for the exchange of views and ideas on new technologies, systems, policies and satellite communication services. Based in Seoul, APSCC organizes the Asia-Pacific Satellite Communication Conference and Exhibition for Global Communications on a biennial basis and has become a regional body for the satellite communications industry. The Programme provided technical advice to APSCC in 2001 and will continue to support its work in 2002.

3. American Institute of Aeronautics and Astronautics

25. The Office for Outer Space Affairs co-sponsored the sixth Workshop on International Space Cooperation, organized by the American Institute of Aeronautics and Astronautics under the theme

"International space cooperation: addressing challenges of the new millennium". The Office contributed to the planning of the discussions during the Workshop, which was held in Seville, Spain, from 11 to 15 March 2001. Through the United Nations Programme on Space Applications, the Office defrayed the costs of air travel and living expenses of four participants from developing countries. The findings and recommendations emanating from the Workshop concerned such issues as future needs for the management of space traffic, Earth-threatening asteroids and comets, GNSS, links between space and the public, and the contribution of space systems to the implementation and verification of international environmental agreements.

4. XX Plenary Meeting of the Sociedad de Especialistas Latinoamericanos en Percepción Remota

26. The United Nations Programme on Space Applications will co-sponsor the XX Plenary Meeting of the Sociedad de Especialistas Latinoamericanos en Percepción Remota (SELPER) and X Latin American Symposium on Remote Sensing, to be held at La Paz from 10 to 15 November 2002. The Programme is contributing to the planning of the Meeting and the Symposium, whose theme will be "Meeting the needs of users and decision makers: towards operational applications of Earth observation and data collection systems".

5. Conference on the theme "Under African skies"

27. A conference on the theme "Under African skies", held in Lusaka in June 2001, was scheduled to coincide with the first total solar eclipse of the millennium. The conference was organized by members of the Space Generation Advisory Council to promote interest in education and research in space science and technology among the 300 young Africans who participated in the event. A representative of the Office for Outer Space Affairs made a presentation on international cooperation in space and on the role of the Space Generation Forum of UNISPACE III.

6. Committee on Earth Observation Satellites

28. The 15th plenary meeting of the Committee on Earth Observation Satellites (CEOS) was held in Kyoto, Japan, from 6 to 7 November 2001. During the meeting, a representative of the Office for Outer Space Affairs made a presentation on the progress made by the Committee on the Peaceful Uses of Outer Space and its Scientific and Technical Subcommittee in implementing the recommendations of UNISPACE III, in particular through the action teams established by the Committee under the voluntary leadership of Member States. The representative informed CEOS that the Committee had encouraged the action teams to actively consider the participation of non-governmental entities in their work. The representative also described action taken under the United Nations Programme on Space Applications related to training and education for capacity-building and other action being undertaken or planned in areas of priority, such as disaster management.

29. At its 15th plenary meeting, CEOS noted the cooperation between its ad hoc Disaster Management Support Group, the secretariat of the International Strategy for Disaster Reduction and the Office for Outer Space Affairs, including the plans for holding joint regional workshops on the use of space technology in disaster management. CEOS decided to co-sponsor two regional workshops on the subject to be held in 2002, for Africa and for Asia and the Pacific. Regarding follow-up action of UNISPACE III, CEOS noted that some action teams, such as the one relating to disaster management, had already started their work. CEOS agreed that its participation in follow-up action of UNISPACE III was important and decided to seek permanent observer status with the Committee in order to be better informed of the developments in the work of the Committee in that regard.

7. Follow-up activities of training courses sponsored by the United Nations and the European Space Agency

30. Under the United Nations Programme on Space Applications emphasis continues to be placed on collaboration with the Department of Economic and Social Affairs of the Secretariat and ESA in implementing follow-up projects of the training courses on applications of data from the European remote sensing satellite (ERS) and other satellites to natural resources, renewable energy and the environment that were held in Frascati, Italy, in 1993, 1994, 1995 and 1997. In 2001, a pilot project in Viet Nam (for Asia and the Pacific) was completed and its

results presented to decision makers in the General Department of Land Administration of Viet Nam. Work continued on projects in Latin America (Argentina, Bolivia and Chile) and in Africa (Burkina Faso and the Regional Training Centre for Agrometeorology and Operational Hydrology and Their Applications (AGRHYMET)).

F. Training courses, workshops, conferences and symposia organized by the United Nations

1. Activities carried out in 2001

31. In 2001, six workshops, one training course, one meeting of experts and one symposium were conducted under the auspices of the United Nations Programme on Space Applications. A summary of each of the activities is given in annex I to the present report.

2. Activities scheduled for implementation in 2002

32. The training courses, workshops, meetings and symposia scheduled for 2002 are shown in annex II.

3. Activities proposed for implementation in 2003

33. The following activities are proposed for 2003:

(a) Thirteenth United Nations/Sweden International Training Course on Remote Sensing Education for Educators, to be held in Stockholm and Kiruna, Sweden, in May-June 2003;

(b) United Nations/Austria Symposium on the Operational Use of Space Technology in Sustainable Development, to be held in Graz, Austria, in September 2003;

(c) United Nations/International Astronautical Federation Workshop on the Use of Space Technology for the Benefit of Developing Countries, to be held in Bremen, Germany, in September-October 2003;

(d) Twelfth United Nations/European Space Agency Workshop on Basic Space Science, for the benefit of developing countries in Asia and the Pacific;

(e) United Nations workshop on remote sensing applications for the benefit of developing countries in western Asia;

(f) United Nations/European Space Agency Workshop on the Use of Space Technology in Disaster Management, for the benefit of countries in western Asia, to be held in Lebanon.

G. Space information

34. Information for Member States and the general public on the latest developments in the activities carried out under the United Nations Programme on Space Applications can be found on the web site of the Programme (http://www.oosa.unvienna.org/sapidx.html), which is part of the web site of the Office for Outer Space Affairs. It contains information on activities that have been implemented as well as reports and press releases issued within the framework of the Programme. The schedules, objectives and programmes of planned activities and projects are also included on the web site.

35. The updated directory entitled *Education, Training, Research and Fellowship Opportunities in Space Science and Technology and Its Applications* (ST/SPACE/10) has been published. The directory has also been made available on the web site of the United Nations Programme on Space Applications.

36. The thirteenth in the series of publications, containing selected papers from the activities of the Programme, entitled *Seminars of the United Nations Programme on Space Applications* (ST/SPACE/7), has been issued.

V. Voluntary contributions

37. The successful implementation of the activities of the United Nations Programme on Space Applications in 2001 benefited from the support and voluntary contributions of Member States and their institutions, as well as from the assistance and cooperation of regional and international governmental and non-governmental organizations. In 2001, the Programme received voluntary contributions, both in money and in kind, including the sponsorship of technical and scientific presentations by experts, as described below.

38. A number of Member States and governmental and non-governmental organizations provided support for the activities of the United Nations Programme on

Space Applications in 2001 in various ways, including the following:

(a) A voluntary cash contribution of $3,000 from the Government of the Czech Republic, in support of the activities of the Programme, and 150,000 francs from the Government of France for activities relating to natural disasters;

(b) A financial contribution of $110,000 from ESA and 50,000 francs from the Centre national d'études spatiales of France in support of specific activities of the Programme in 2001 that they co-sponsored (see annex I);

(c) Defrayal by the Government of Sweden of the costs of international air travel for 13 participants, local organization and facilities, room and board, and local transportation in respect of a training course organized in Stockholm and Kiruna, Sweden (see annex I);

(d) Defrayal by the Government of Austria (the Ministry for Foreign Affairs and the Ministry for Transport, Innovation and Technology), the State of Styria and the City of Graz of the costs of international air travel of participants, local organization and facilities, room and board, and local transportation in respect of a symposium organized in Graz (see annex I);

(e) A financial contribution of $500,000 from the Government of the United States of America to co-sponsor four workshops and a meeting of experts on the use of global navigation satellite systems in 2001 and 2002 (see annexes I and II);

(f) A financial contribution of $20,000 from the European Commission to co-sponsor a workshop on the use of GNSS in 2001 (see annex I);

(g) Defrayal, by the host Governments of activities of the Programme, of the costs of local organization and facilities, room and board for some participants from developing countries and local transportation (see annex I);

(e) Sponsorship of experts by Member States and their space-related institutions, as well as by regional and international organizations, to make technical presentations and take part in deliberations during activities of the Programme (see annex I).

VI. Financial provisions and administration of activities in the biennium 2002-2003

39. The activities of the United Nations Programme on Space Applications in 2002 covered in the present report will be implemented as follows:

(a) *Financial provisions.* Under the regular budget of the United Nations, an amount of $510,200 before recosting was approved as resource requirements for fellowships and grants in the programme budget by the General Assembly, at its fifty-sixth session, for implementing the activities of the Programme during the biennium 2002-2003. An amount of $282,800, which has been appropriated from this budget after recosting, will be used to implement the activities of the Programme in 2002. In order to effectively carry out its mandated and expanded activities, particularly those aimed at implementing the recommendations of UNISPACE III, the Programme must solicit additional funds, in the form of voluntary contributions, in support of its activities. Those contributions will be used to supplement the regular budget of the Programme;

(b) *Administration by and contributions and participation of staff.* The Office for Outer Space Affairs and, in particular, the Expert on Space Applications and his staff will carry out the activities described in the present report. In that connection, travel will be undertaken as appropriate by the Expert and the staff of the Office under the provisions of the travel budget of the Office for the biennium and as may be necessary from voluntary contributions.

Notes

[1] *Official Records of the General Assembly, Fifty-fifth Session, Supplement No. 20* (A/55/20), para. 71.

[2] Ibid., *Fifty-sixth Session, Supplement No. 20* and corrigendum (A/56/20 and Corr.1), para. 69.

[3] Ibid., para. 68.

[4] Ibid., para. 69.

[5] Ibid., paras. 50-55.

Annex I

Summary of United Nations training courses, workshops and conferences held in 2001

1. Fourth United Nations/European Space Agency/Committee on Space Research Workshop on Data Analysis and Image-Processing Techniques (Damascus, 25-29 March 2001)

Sponsoring country: Syrian Arab Republic

Sponsoring organizations: the United Nations, European Space Agency (ESA), Committee on Space Research

Host institutions: General Organization of Remote Sensing (GORS) of the Syrian Arab Republic

Funding support: Air travel and living expenses for 20 participants were covered by the United Nations, ESA and GORS.

Number of countries: 15

Total number of participants: 56

Outcome of the activity

The workshop was organized for the benefit of western Asia. Individuals from the regional centres for space science and technology education, affiliated to the United Nations, that are located in India, Morocco and Nigeria and the one to be inaugurated in Jordan also participated in and contributed to the workshop. Presentations and discussions focused on data analysis and image processing in the areas of remote sensing, geographic information system (GIS), photogrammetry, and their applications in natural resources management, particularly monitoring water resources, desertification, land use, environmental pollution, and ecosystem changes in arid areas. Participants used the opportunity to undertake practical work at the facilities of GORS, including its meteorological station, chemical laboratory, aerial photographs and space images laboratory, visual interpretation laboratory and digital processing laboratory. The workshop fostered communication and cooperation among participants, particularly from Arab countries.

(A detailed report on the training course is contained in document A/AC.105/765 and Corr.1.)

2. Eleventh United Nations/Sweden International Training Course on Remote Sensing Education for Educators (Stockholm and Kiruna, Sweden, 2 May-9 June 2001)

Sponsoring country: Sweden

Sponsoring organization: United Nations

Host institutions: Stockholm University and Satellus AB of Metria and the National Land Survey of Sweden

Funding support: Air travel expenses for 13 participants were defrayed by the United Nations; all other expenses, including room and board and local travel, were covered by the Swedish International Development Cooperation Agency (Sida).

Number of countries: 22

Total number of participants: 26

Outcome of the activity

The course was conducted specifically for the benefit of university educators from developing countries with the objective of developing their knowledge and skills in remote sensing technology and enabling them to introduce elements of the technology, as appropriate, in the academic curricula of their universities and institutes.

The Office for Outer Space Affairs of the Secretariat and Stockholm University conducted a global survey on the impact of the training courses held in the period from 1990 to 2000. The results of the survey indicated that the participants had been applying the knowledge that they had gained in the courses to enhance educational programmes in remote sensing and GIS at their institutions. The results also indicated the need for supplementary training in advance disciplines, such as digital data processing, GIS, global navigation satellite systems (GNSS) and use of high-resolution satellite images and data.

(A detailed report on the training course is contained in document A/AC.105/767.)

3. Tenth United Nations/European Space Agency Workshop on Basic Space Science: Exploring the Universe; Sky Surveys, Space Exploration and Space Technologies (Reduit, Mauritius, 25-29 June 2001)

Sponsoring country: Mauritius

Sponsoring organizations: the United Nations, ESA, the Centre national d'études spatiales (CNES) of France, the German Space Agency (DLR), the National Aeronautics and Space Administration (NASA) of the United States of America, the National Astronomical Observatory of Japan and the Planetary Society

Host institution: University of Mauritius

Funding support: Air travel and living expenses for 18 participants were covered by the United Nations and ESA.

Number of countries: 28

Total number of participants: 65

Outcome of the activity

The participants presented their research findings, status reports on their research, and project proposals. The space scientists from Mauritius presented to the international community, for the first time, results emanating from the Mauritius Radio Telescope, a collaborative effort of India and Mauritius. Taking into account the recommendations of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III) and the past United Nations/European Space Agency workshops on basic space science, participants split into working groups to elaborate on the following four major topics covered by the programme: (a) space exploration, (b) sky surveys, (c) education, training and services and (d) space technologies.

The working groups developed, individually and collectively, a set of observations and recommendations to chart the future course of workshops of this nature. The working groups also initiated an evaluation of the achievements of the United Nations/European Space Agency workshops on basic space science in the period from 1991 to 2000.

(A detailed report on the symposium is contained in document A/AC.105/766.)

4. First United Nations/United States of America Workshop on the Use of Global Navigation Satellite Systems (Kuala Lumpur, 20-24 August 2001)

Sponsoring country: Malaysia

Sponsoring organizations: the United Nations and the Government of the United States

Host institution: Department of Survey and Mapping Malaysia, Ministry of Land and Cooperative Development of Malaysia

Funding support: Air travel and living expenses for 27 participants were covered by the Government of the United States. The Government of Malaysia provided the meeting facilities and board for all the funded participants.

Number of countries: 23

Total number of participants: 206

Outcome of the activity

The participants of the workshop were briefed on the modernization policy of the Global Positioning System (GPS) of the United States, as well as the current status and future developments of the Global navigation Satellite System (GLONASS) of the Russian Federation. The workshop reviewed existing and potential applications of GNSS for promoting sustainable development and protecting the environment for the benefit of countries in Asia and the Pacific. The participants stressed the need to strengthen regional cooperation in the use of GNSS and to avoid duplication of efforts in GNSS-related projects that are being carried out in the region.

(A detailed report on the workshop is contained in document A/AC.105/771.)

5. United Nations Meeting of Experts on the Regional Centres for Space Science and Technology Education: Status and Future Developments (Frascati, Italy, 3-7 September 2001)

Sponsoring organizations: the United Nations and ESA

Host institution: European Space Research Institute (ESRIN) of ESA

Funding support: Air travel and living expenses for 20 participants were covered by the United Nations and ESA.

Number of countries: 19

Total number of participants: 33

Outcome of the activity

The experts reviewed the operation and establishment of the regional centres for space science and technology education with a view to enhancing cooperation among the centres. The experts focused on the management of the centres and updated their curricula in the following fields: (a) remote sensing; (b) satellite meteorology; (c) satellite communication; and (d) space science. The updated education curricula will be provided to the regional centres that have been inaugurated in India for Asia and the Pacific, in Morocco and Nigeria for Africa and in Brazil and Mexico for Latin America and the Caribbean. The curricula of the centre to be inaugurated in Jordan for western Asia would also include these fields. In updating the curricula, the experts took into account the results of the past nine-month postgraduate courses organized since 1996 at the centre in India and since 1998 at the centres in Morocco and Nigeria.

(A detailed report on the meeting, including the updated curricula, will be issued in time for the forty-fifth session of the Committee on the Peaceful Uses of Outer Space.)

6. Second United Nations/Austria/European Space Agency Symposium on Enhancing the Participation of Youth in Space Activities (Graz, Austria, 17-20 September 2001)

Sponsoring country: Austria

Sponsoring organizations: the United Nations and ESA

Host institution: Research Centre Graz of the Austrian Academy of Sciences

Funding support: Air travel and living expenses for 29 participants were covered by the Government of Austria (the Ministry for Foreign Affairs and the Ministry for Transport, Innovation and Technology), the State of Styria, the City of Graz and ESA.

Number of countries: 35

Total number of participants: 76

Outcome of the activity

The participants were provided with an overview of the mechanisms, activities and programmes through which young people could benefit from and contribute to space activities for the benefit of humanity. These included such mechanisms as the Space

Generation Advisory Council in support of the United Nations Programme on Space Applications, which has been granted observer status with the Committee on the Peaceful Uses of Outer Space. The main issues addressed in the symposium included education and outreach activities. The results and progress on some of the activities and projects of the Space Generation Advisory Council that were initiated as a result of the symposium held in 2000 were presented to the participants of this Symposium. Through the discussions in working groups, the participants identified issues of importance to each region that they represented. They also examined additional projects that could serve to implement some of the recommendations contained in "The Space Millennium: Vienna Declaration on Space and Human Development", adopted by UNISPACE III, and in the report of the Space Generation Forum, organized by and for young professionals and students during UNISPACE III.

(A detailed report on the symposium is contained in document A/AC.105/774.)

7. United Nations/International Astronautical Federation Workshop on Making Space Applications Operational: Opportunities and Challenges for Sustainable Development (Albi, France, 27-29 September 2001)

Sponsoring country: France

Sponsoring organizations: the United Nations, the International Astronautical Federation (IAF), ESA and CNES

Host institution: Ecole des Mines in Albi, France

Funding support: Air travel and living expenses for the period of the workshop and the fifty-second International Astronautical Congress, as well as registration fees for the Congress for 21 participants, were covered by the United Nations, IAF, ESA and CNES.

Number of countries: 30

Total number of participants: 62

Outcome of the activity

The participants noted that the following would be necessary for the greater operational use of space technologies in projects to promote sustainable development: (a) awareness of decision makers and programme managers of the usefulness of space technologies to support development projects; (b) funding dedicated to the use of space technologies; and (c) sufficient local capacity to use space-related technologies. The workshop included three case studies of successful projects that addressed local or national needs with the use of space technology and received funding support. One meeting was dedicated to funding and financing strategies and included presentations by the Inter-American Development Bank, the African Development Bank and the Canadian International Development Agency. The participants provided guidelines to follow in order to improve the possibilities of securing funding for pilot or operational projects and programmes.

(A detailed report on the workshop is contained in document A/AC.105/775.)

8. United Nations/International Academy of Astronautics Workshop on Small Satellites at the Service of Developing Countries: the African Perspective (Toulouse, France, 2 October 2001)

Sponsoring country: France

Sponsoring organizations: the United Nations and the Subcommittee on Small Satellites for Developing Nations of the International Academy of Astronautics (IAA)

Funding support: The workshop was held as part of the fifty-second International Astronautical Congress and was open to all participants of the Congress; therefore, no additional funding was required.

Total number of participants: approximately 55

Outcome of the activity

The workshop was organized within the framework of the fifty-second International Astronautical Congress. While the workshop was open to all participants of the Congress, the situation in Africa was used as an example of the benefits of small satellites for developing countries. The workshop participants reviewed the advancements made in Africa in the development and utilization of small satellites in the light of the recommendations made by previous workshops organized by the IAA Subcommittee on Small Satellites for Developing Nations.

The workshop recognized the very significant spin-off benefits to be gained by initiating space activities with small satellite programmes. Small satellite projects are contributing to the enhancement of international cooperation within Africa. The workshop stressed the importance of applications that provide sustainable economic benefits for countries in Africa, for example, in the fields of disaster mitigation, agriculture, monitoring of desertification and forest resources.

(A detailed report on the workshop is contained in document A/AC.105/772.)

9. Second United Nations/United States of America Regional Workshop on the Use of Global Navigation Satellite Systems (Vienna, 26-30 November 2001)

Sponsoring country: United States of America

Sponsoring organizations: the United Nations, the European Commission and the Austrian Space Agency

Host country and institution: Austria and the Austrian Space Agency

Funding support: Full or partial air travel and living expenses for 49 participants were defrayed by the Government of the United States and the European Commission. The Government of Austria provided the meeting facilities.

Number of countries: 33

Total number of participants: 146

Outcome of the activity

More than 40 policy makers, programme managers and researchers of government agencies, research institutes and universities as well as industry engaged in such fields as environment protection, agriculture, transport, cartography and geodesy participated in the workshop. Through more than 40 technical presentations, they were briefed on the latest status of the existing and planned GNSS and their augmentation systems. They were also briefed on the latest applications of GNSS technology in environmental monitoring, precision agriculture, geodesy, cartography, as well as air, maritime and land transportation. For the participants from eastern Europe, the workshop served as a forum in which to exchange views and establish direct contact with policy makers and experts in the use and applications of GNSS from the United States, western European countries and other developed countries.

The participants recognized the need to ensure the compatibility among GPS of the United States, GLONASS of the Russian Federation and the planned Galileo system of European countries. The participants stressed that user needs and requirements must be fully taken into account in the development phase of Galileo. The participants identified capacity-building, financial resources to establish the necessary infrastructure and coordination at all levels as essential elements to further increase the use and various applications of GNSS technology in eastern Europe. The participants accorded high priority to the need to protect GNSS signals from unwanted frequency interference.

(A detailed report on the workshop will be contained in document A/AC.105/776, to be presented to the Committee on the Peaceful Uses of Outer Space at its forty-fifth session.)

Annex II

United Nations Programme on Space Applications: schedule of training courses, workshops, conferences and symposia for implementation in 2002

Activity	*Title*	*Place (and date)*	*Objective*
1	United Nations Workshop on Satellite-Aided Search and Rescue	Bangalore, India (18-22 March 2002)	To promote the use of the International Search and Rescue Satellite System (COSPAS-SARSAT) for countries in Asia and the Pacific
2	Third United Nations/United States of America Regional Workshop on the Use of Global Navigation Satellite Systems	Santiago (1-5 April 2002)	To promote the use of global navigation and positioning satellite systems in development activities; for countries in Latin America and the Caribbean
3	Twelfth United Nations/ Sweden International Training Course on Remote Sensing Education for Educators	Stockholm and Kiruna, Sweden (2 May-8 June 2002)	To enable university professors from developing countries in all regions to include remote sensing in their curricula
4	Fourth United Nations/United States of America Regional Workshop on the Use of Global Navigation Satellite Systems	Lusaka (15-19 July 2002)	To promote the use of global navigation and positioning satellite systems in development activities; for countries in Africa
5	United Nations/South Africa/ European Space Agency Workshop on the Use of Space Technology in Sustainable Development, co-sponsored by Astrium	Stellenbosch, South Africa (August 2002)	To appraise high-level policy makers of the benefits of space applications in promoting sustainable development
6	Eleventh United Nations/ European Space Agency Workshop on Basic Space Science	Cordoba, Argentina (9-13 September 2002)	To review follow-up activities of previous workshops in this series and decide on further action; for countries in Latin America and the Caribbean
7	Third United Nations/Austria Symposium/European Space Agency on Enhancing the Participation of Youth in Space Activities	Graz, Austria (September 2002)	To review follow-up activities of the symposium in this series held in Graz in September 2001 and to decide on new action; for the benefit of young people from all regions

Activity	*Title*	*Place (and date)*	*Objective*
8	United Nations/Economic Commission for Africa/ European Space Agency/ Committee on Earth Observation Satellites Workshop on the Use of Space Technology in Disaster Management, for the benefit of Africa	Addis Ababa (June 2002)	To identify disaster of concern to Africa and to propose possible pilot projects to enhance disaster management with the use of space technology
9	United Nations/International Astronautical Federation workshop on "Space Solutions for Global Problems: Building Working Partnerships with All Stakeholders in Human Security and Development"	Houston, United States of America (10-12 October 2002)	To review the follow-up actions of UNISPACE III to enhance human security and development through space applications, examine successful cases and develop a strategy to build partnership with civil society in making further progress
10	Third United Nations/ International Academy of Astronautics Workshop on Small Satellites at the Service of Developing Countries: beyond Technology Transfer	Houston, United States of America (12 October 2002)	To review the existing and proposed applications of small satellites, examine their operational aspects and assess the benefits for developing countries
11	United Nations/Economic and Social Commission for Asia and the Pacific/European Space Agency/Committee on Earth Observation Satellites Workshop on the Use of Space Technology in Disaster Management, for the benefit of Asia and the Pacific	Bangkok (November 2002)	To identify disasters of concern to Asia and the Pacific and to propose possible pilot projects to enhance disaster management with the use of space technology
12	United Nations/United States of America International Meeting of Experts on the Use of Global Navigation Satellite Systems	Vienna (November 2002)	To review the recommendations of the four regional workshops on global navigation satellite systems and to recommend possible follow-up action
13	United Nations/European Space Agency Workshop on Remote Sensing for Environmental Monitoring and Natural Resources Management	Prague (2002)	To improve decision-making in development activities while protecting the environment; for countries in eastern Europe